

Responsible Research and Innovation in Digital Agriculture

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Digitalisation in Agriculture

‘Digital
Agriculture’

‘Smart
Farming’

‘Agriculture 4.0’

‘AgTech’

FARM IRELAND

Tuesday 19 February 2019

NEWS

AGRI-BUSINESS

PROPERTY

DAIRY

TILLAGE

BEEF

SHEEP

MACHINERY

The smart farming revolution - how technology will change farmers' lives

Another agricultural transformation is about to unfold and it will be driven by data, drones and automated machinery



1. Impact of Technology on Society

“Technology-driven change is outpacing society's ability to manage its impacts... If proper planning for social and economic disruption does not take place, then many will be excluded from the potential benefits... Greater planning for adverse social and economic effects from the increasing adoption of digital technologies in society is needed.”

- (RAND, 2017)

Impacts of Digital Agriculture

Stakeholder interviews with key governance actors in Ireland ¹

Benefits

- Increased efficiency (more outputs, less inputs)
- Increased quality-of-life
- More free time
- Safer work environment
- Healthier animals
- Tackling societal challenges and needs: more sustainable, healthier, safer food production

Impacts of Digital Agriculture

Stakeholder interviews with key governance actors in Ireland ¹

Perceived risks – conflicting and contested views

- Digital divide
 - Inequitable development *vs. technology on a continuum*
- Knock-on effects of farmer-technology interaction
 - Loss of intuitive skills *vs. development of 'new farmers'*
 - Farmer isolation
 - Reduced human-animal interactions
- Consumer rejection *vs. a 'non-issue' for consumers*
- Data ownership and sharing
 - Protecting privacy and rights *vs. stimulating innovation*

Risk Perception:
Different actors
justifiably hold
different opinions
on possible risks


Governing Risks: Science & Society

- Science, society, and the development of technology:
♥ *'It's complicated'*
- Past technology development:
 - Failed to account for societal values & risk perceptions
 - Failed to consider, and account for, the fact that in creating solutions, we sometimes also create new risks and dilemmas
- Consensus that changes are needed in how we 'do research'

Controversies and failures in fulfilling societal expectations:

- GMOs
- Fracking
- Food safety crises (e.g. BSE)
- Cambridge analytica

(Ludwig et al. 2019; Von Schomberg, 2019)



Responsible Research and Innovation
is a way to do research that takes an inclusive
and long-term perspective on the type
of world in which we want to live

2. Responsible Research and Innovation

- A values-based theoretical framework for governing science & technology
- RRI a cornerstone of many national and international research programmes (e.g. EU Horizon 2020)
- RRI is not about preventing technology development or innovation
 - Ensures that the trajectory which innovation takes is responsive to the concerns, needs and expectations of society
 - Allows us to harness the benefits of technology, while also managing the risks

“Taking care of the future through collective stewardship of science and innovation in the present” (Ludwig et al. 2019)

Responsible Research and Innovation

Value-based Framework: 4 key dimensions

Explore possible **impacts**
Better understand how R&I
shapes the future
Evaluate risks '**up-stream**'



Engage **diverse actors** in R&I
Early and continuous
involvement
Obtain different **types of**
knowledge

Reflect on your own
underlying assumptions,
values, and purposes
Actively consider the views of
others



Modify or take action in response
to changing circumstances,
knowledge, and perspectives
Align R&I with needs and values
expressed by actors

Responsible Research and Innovation

- We can view RRI as an ‘organising’ framework
- The 4 dimensions – Anticipation, Inclusion, Reflexivity, and Responsiveness – act as common objectives for how we carry out research and innovation
- How do we do this in practice?
- There are many mechanisms we can use to embed these dimensions in our research

3. RRI in Practice: Examples

- RRI dimension of ‘inclusion’ is a useful starting point
- Inclusion underpins all the other dimensions in RRI (Rose & Chilvers, 2019)
- Many examples of inclusion in research and innovation
- Embedding RRI principles in research: examples from current projects



Examples of Inclusion

- Stakeholder groups
- Farmer technology groups
- Informal dialogue
- EIP-Agri op. groups
- Design thinking
- KT Groups
- Co-creation
- Social science
- Citizens assembly
- On-farm pilot studies
- Demonstration farms
- Open days
- Citizen science
- Research scoping / prioritisation exercises
- Foresight studies
- Farmer conferences
- Multi-actor projects
- Interdisciplinary research
- Public-private partnerships

FAIRshare Project

- EU H2020 Project (2018-2023)
- Supporting farmer engagement with digital technology, through sharing, adapting and enabling use of digital tools and services by advisors
 - Inventory of existing digital advisory tools and services (DATS): online store and networking facility
 - Identifying ‘good practice’ DATS (co-design approach)
 - Piloting good practice DATS across geographic and sectoral areas (living labs)
 - Roadmap and policy recommendations for rolling out DATS across Europe

Participatory Methods

- FAIRshare actors supported to implement Participatory Methods
- Participatory Methods = activities that allow ordinary people to play an active and influential part in decisions which affect their lives
- Field-tested approaches developed from scientific evidence and practical experience
- Training and support provided by trained social scientists
- Allows project partners implement their work tasks in an inclusive manner



RRI Workshop Series

- Participatory workshops reflecting on wider ethical and social impacts
- Topic 1: Digital Ethics in Agriculture
 - Collaboration with Dr. Simone van der Burg (WUR and IOF2020)
 - Workshops with farmers, scientists, agtech industry and policy-makers on preferred future governance of data in agriculture
- Built-in 'Reflexivity Sessions' at meetings to consider implications for FAIRshare work



NIVA Project

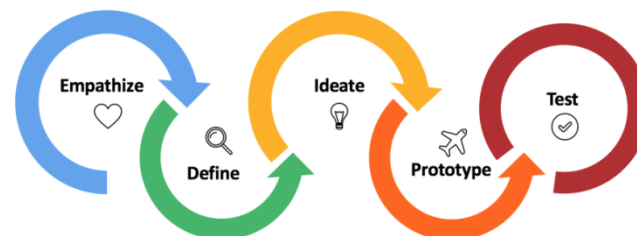


- EU H2020 Project (2019-2022)
- Administrative bodies from 9 EU Member States, along with research institutions and private organizations
- Overall goal is to ‘modernise’, via digitalisation, the *Integrated Administration and Control System (IACS)* – the instrument for governance of CAP
- Aims to improve the IACS by using digital solutions and e-tools, creating reliable methodologies and harmonised data sets for monitoring agricultural performance, and reducing administrative burden for farmers, paying agencies and other stakeholders
- 9 use cases led by 9 European Administrative bodies (‘Paying Agencies’)
- Irish Use Case: Development of a geo-tagged photo application system to reduce administrative burden associated with monitoring agricultural performance

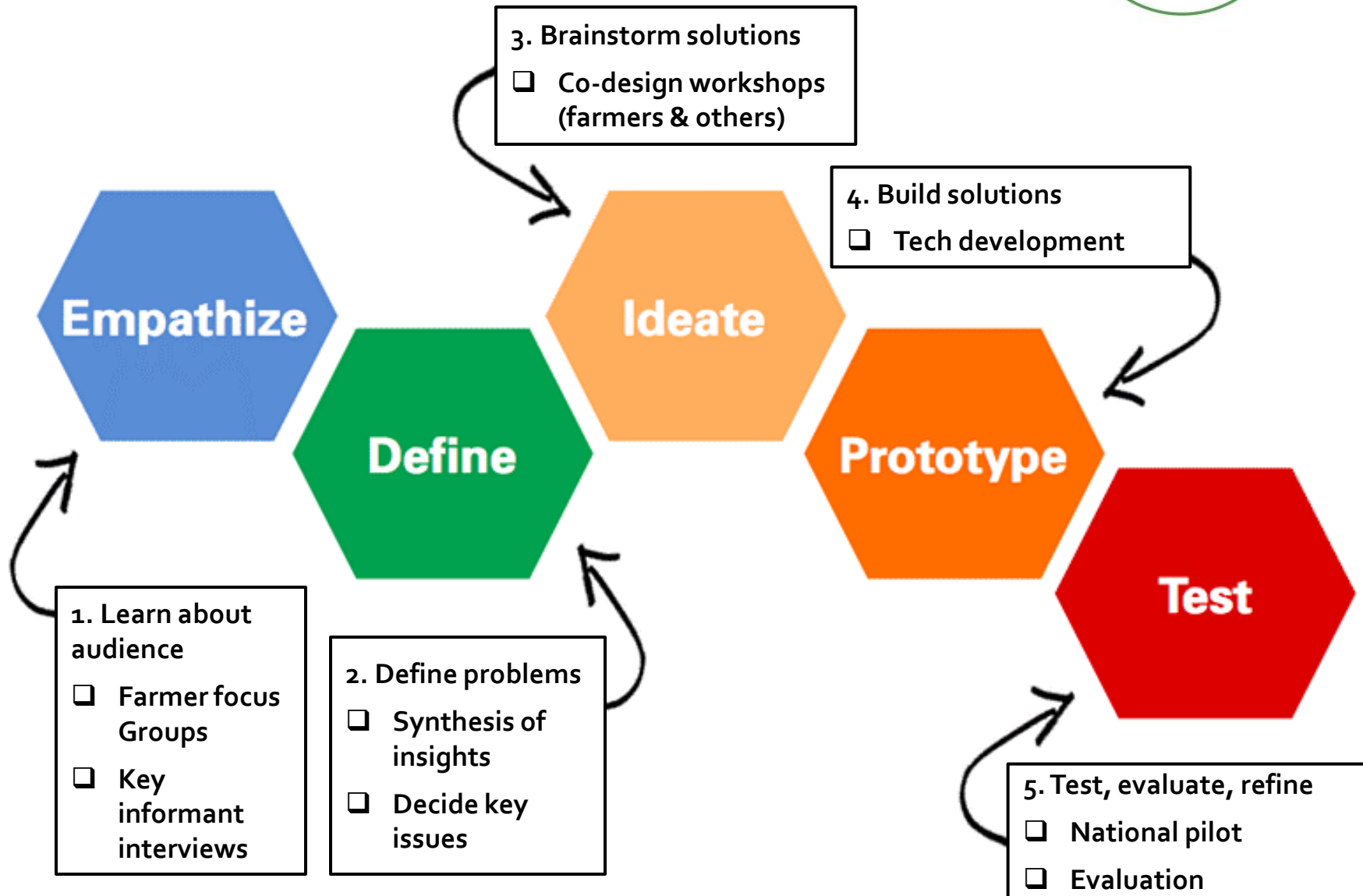
User-centred Design

Principles:

- Listen to and understand the needs of the end-users
 - Requires a systematic and equitable process of engagement
- Develop *with*, test *with* and iterate *with* end-users
 - Requires a participatory approach to development
- User-centred design as a form of upstream ‘risk management’
 - Capture concerns early stage of tech develop
 - Incorporate solutions into design or consider other required responses



User-centred Design



We want to avoid this...



What was designed

What (some) users wanted

...and this...



Artificial intelligence risks GM-style public backlash, experts warn

Researchers say social, ethical and political concerns are mounting and greater oversight is urgently needed

THE IRISH TIMES

NEWS SPORT BUSINESS OPINION LIFE & STYLE CULTURE

Farmers up in arms over potential misuse of data

While big data application can make agricultural practices more efficient, the benefits come at the potential price of privacy

...and instead, see more of this:



PHYS.ORG Topics

DECEMBER 20, 2018

Responsible innovation key to smart farming

by University of East Anglia

HOME » AGRI-BUSINESS » FARMERS CALLED TO VOICE THEIR VIEWS AT FIRST 'SMART FARMING' WORKSHOP

Farmers called to voice their views at first 'Smart Farming' workshop

Sylvester Phelan | May 10, 2019, 6:50pm



THE EIP-AGRI SUPPORTS THE AGRICULTURAL COMMUNITY IN SHAPING ITS DIGITAL FUTURE BY WORKING TOGETHER

Responsible Data in Agriculture



Thank You!

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Photo Credit: Juliette Maire, Teagasc